

through a large arc. By this construction the finger motion of the operator is small, and the movement of the shutter can be as great as desired. Also by this arrangement the de-  
 5 tent *a* or springs 36, 37, although they press upon the shutter with comparatively a small pressure, resist the pressure of the operator's finger to move the shutter to a much larger extent than they would were this arrange-  
 10 ment of leverage not adopted, and whereby the pressure of the operator's finger is accumulated on the face of the lever 19 until sufficient power is applied to start the shutter, when the shutter is moved rapidly by the ac-  
 15 cumulated pressure that the operator's finger has acquired; and in this way the shutter can be quickly operated and made to spring through a considerable arc, although the operator's finger moves through a very small  
 20 arc; and the operator's finger is allowed to accumulate the pressure by reason of the fact that he is operating against the long lever and by a movement of the finger lever in the small arc.

25 The arc of movement of the finger lever, as I have above referred to it, commences only after one of the dogs of the connector 13 has come into co-operative relationship with one of the notches of the lever 7, the prior move-  
 30 ment of the finger lever being necessary to take up the slack which must exist between the end of the connector 13 and the end of the lever 7.

A device such as shown in Figs. 11 and 12  
 35 for permitting the shutter to be held for time exposures could be used. I, however, prefer that shown in Figs. 11 and 12 which is very simple and inexpensive. It consists in a spring bar *j* secured at its lower end to the  
 40 shutter board 1 as at *k*, which is provided at its upper end with an outwardly extending pin *e*. The board 1 is provided with an opening *m*, and into this opening the pin *e* projects, which opening is so located, that when  
 45 the edge of the shutter 3 is adjacent thereto the exposing orifice 4 therein will be over the lens opening *n* in the shutter board or equivalent. If, prior to the movement of the shutter, the pin *e* is projected through the open-  
 50 ing *m* (as shown in dotted lines, Fig. 12) it will bar the further movement of the shutter, and hold its exposing orifice 4 over the lens opening *n*, and when pressure on the spring bar *j* is removed, the pin *e* will be withdrawn, which  
 55 will permit the shutter to traverse its complete path, shutting off the light and completing the exposure, the shutter then being under tension, as before set forth. The preferred method of use, however, would be to cause the  
 60 shutter to strike the pin *e* by a movement of the shutter in one direction, removing the tension of the shutter by removal of the finger pressure on the finger lever 19, the shutter then being in the exposing position, and  
 65 after the desired time has elapsed, moving the shutter in the reverse direction, in the man-

ner heretofore set forth. The movements of the shutter in this way will be positive.

Many changes in form can be made, and other adaptations used, without departing 70 from the spirit of my invention.

I claim—

1. The combination of a photographic shutter adapted to be reciprocated past a lens opening, a reciprocating finger piece imparting 75 motion to the shutter, and devices for transmitting said motion from said finger piece to said shutter, the finger piece moving always in the same direction when imparting said motion to said shutter in either direction of 80 the latter, substantially as described.

2. The combination of a photographic shutter adapted to be moved past a lens opening, a lever connected to said shutter to rock the same, and a reciprocating propelling bar or 85 connector 13, said connector being provided with projections 23, 24, arranged respectively above and below the lever pivot, said projections contacting with said lever alternately above and below its pivot as the connector is 90 propelled toward the lever, substantially as described.

3. The combination of a shutter, a lever connected to said shutter to rock the same, a reciprocating propelling bar or connector 95 adapted to be propelled into contact with said lever, means for withdrawing said bar from contact with said lever, and a guide spring, as 12, for guiding said bar laterally 100 relatively to said lever, said guide spring engaging said bar and said lever, and having sliding connection with one of them, substantially as described.

4. The combination of a camera shutter, a lever connected thereto to rock the same, a 105 reciprocating propelling bar or connector for actuating said lever, contacting with said lever first on one side of its pivot and then on the other, and a spring engaging said lever and bar for laterally vibrating the bar, sub- 110 stantially as described.

5. The combination of a shutter, a shifting connector or bar, a propelling lever and a 115 link from the lever to the shutter, and connecting devices between the bar and propelling lever, the point of connection of said devices to the propelling lever being nearer to the fulcrum than the juncture of said propelling lever with said link, substantially as de- 120 scribed.

6. The combination of a camera shutter, a lever having one end connected with the shutter to move the same, and a longitudinally moving bar contacting with said lever first on 125 one side of its pivot and then on the other to actuate the lever, and means for transversely moving said bar into its alternate contacting positions, substantially as described.

7. The combination of a camera shutter, a lever actuating the same, a bar moving to and 130 from the lever, and actuating it, and means for transmitting to said bar a transverse vi-